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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/895,570	06/28/2001	Fabrizio Petrini	S-94,651	6942
35068	7590	11/18/2004	EXAMINER	
UNIVERSITY OF CALIFORNIA LOS ALAMOS NATIONAL LABORATORY P.O. BOX 1663, MS A187 LOS ALAMOS, NM 87545			WU, QING YUAN	
			ART UNIT	PAPER NUMBER
			2126	

DATE MAILED: 11/18/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 09/895,570	Applicant(s) PETRINI ET AL.	
	Examiner Qing-Yuan Wu	Art Unit 2127	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 11/25/2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-7 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-5 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☒ Claim(s) 6 and 7 are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 28 June 2001 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. Claims 1-7 are pending in the application.
2. To insure proper consideration and to the extent required by 37 CFR 1.56, applicant is required to supply a copy of the publication references cited in the specification because they are not readily available to the examiner (e.g. see specification, pg. 15, line 20 to pg. 16, line 6).

Drawings

3. Figures 1-2 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). Corrected drawings in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.121(d)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Specification

4. The disclosure is objected to because of the following informalities:
 - a. The Brief Description of Drawing of Figure 20 should refer to Figure 10.
 - b. Page 6, line 7- "DOS" should read --DCS--Appropriate correction is required.

Election/Restrictions

5. Restriction to one of the following invention is required under 35 U.S.C. 121:
 - I. Group I, claims 1-5, drawn to process scheduling, classified in class 718, subclass 102.
 - II. Group II, claims 6-7, drawn to fault handling, classified in class 714, subclass 100.
6. Inventions Group I and Group II are related as subcombinations disclosed as usable together in a single combination. Group I is drawn to a method of scheduling processor jobs in a parallel machine processor or distributed system processors. Meanwhile, Group II is drawn to the effect of the coscheduling method in fault tolerance of the parallel machine processor or distributed system processors. The subcombinations are distinct from each other if they are shown to be separately usable. In the instant case, inventions Group I and Group II has separate utility such as the search for Group I invention is not required for Group II invention and vice versa. See MPEP § 806.05(d).
7. Because these inventions are distinct for the reasons given above and have acquired a separate status in the art as shown by their different classification, restriction for examination purposes as indicated is proper.
8. During a telephone conversation with Mr. Ray G. Wilson, reg. no. 28,351 on 10/4/2004 a provisional election was made without traverse to prosecute the invention of Group I, claims 1-5.

9. Affirmation of this election must be made by applicant in replying to this Office action. Claims 5-6 withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention. Applicant should cancel non-elected claims in the amendment.

10. Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a request under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(i).

Claim Rejections - 35 USC § 112

11. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

12. Claims 1-5 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

a. The following terms lacks antecedent basis:

- i. The number of incoming jobs - claim 1, line 11.
- ii. The information- claim 2, line 4.
- iii. The virtual addresses- claim 4, line 24; claim 5, line 27.

b. The following claim language is indefinite:

- i. As per claim 2, lines 4-7, it is uncertain whether “the information” refers to “the information relative to the communication”, and whether “a descriptor” in line 7 refers to “a descriptor” in line 5 (i.e. if they are the same then “said” or “the” should be used and “the information relative to the communication” and “the descriptor” must be used throughout all the claims).
- ii. As per claim 5, it is uncertain whether “each descriptor” refers to “a strobe interval descriptor control packets” (i.e. is this the same type of descriptor as in claim 2?).

Claim Rejections - 35 USC § 103

13. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

14. Claims 1 and 3 are rejected under 35 U.S.C. 103(a) as being unpatentable over Damani et al (hereafter Damani) (U.S. Patent 5,938,775).
15. As to claim 1, Damani teaches the invention substantially as claimed including a computer implemented method for scheduling processor jobs on a network of parallel machine processors or distributed system processors, comprising the steps of:

accumulating in buffers control information communications generated by each process performed by each processor during a defined time interval [col. 3, lines 29-32; col. 6, lines 1-4; Fig. 3], where adjacent time intervals are separated by intervening strobe intervals for a global exchange of control information; and performing a global exchange of the control information communications at the end of each defined time interval during the intervening strobe interval [col. 2, lines 20-24; col. 5, lines 8-9; col. 7, lines 35-43].

16. Damani does not specifically teach that each processor is informed by all of the other processors of the number of incoming jobs to be received by each processor in a subsequent time interval. However, Damani disclosed communicating the stability/instability of each process in corresponding intervals to ensure overall system stability [col. 2, lines 20-24; col. 5, lines 8-9].

17. It would have been obvious to one of an ordinary skill in the art at the time the invention was made, to have recognized that communication between processes in a parallel processing system would include the exchange of various types of processor information.

18. As to claim 3, this claim is rejected as claim 1 above, in addition Damani does not specifically teach issuing a download command to each processor at the beginning of a strobe interval and scheduling by each processor kernel of communications accumulated prior to the strobe interval to be delivered in the succeeding time interval. However, Damani disclosed active monitoring arrangement that poll each processor to check on errors, upon error detection,

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the faulty process are restarted from latest checkpoint and messages of the failed processes from the message log are replayed since the latest checkpoint [col. 2, lines 36-54].

19. It would have been obvious to one of an ordinary skill in the art at the time the invention was made, to have modified Damani's system to poll each processor at the end of an checkpoint (or beginning of another checkpoint) rather than polling periodically to create a more efficient and systematic design.

20. Claims 2, 4-5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Damani in view of Song et al (U.S. Patent 6,061,711).

21. As to claim 2, Damani teaches the invention substantially as claimed including running on each processor an ongoing process in the presence of a non-blocking communication call and storing the information relative to the communication in a descriptor [col. 2, lines 16-17];

22. Damani does not specifically teach yielding the processor to an operating system in the presence of a blocking communication call and storing the information in a descriptor while suspending the ongoing process and activating a ready process from a ready queue, if any; and putting the ongoing process on the ready queue when the blocking communication call is completed. However, Song disclosed halting a currently running program (hereafter program 1) and context switch in another program (hereafter program 2). The state information of program

1 is saved and is used to context switch in program 1 when program 2 completes executing [Song, abstract, lines 1- 11].

23. It would have been obvious to one of an ordinary skill in the art at the time the invention was made, to have combined the fault tolerance system of Damani and Song's context switching system because they both teach the execution of plurality of processes and achieving parallel processing [Song, col. 1, lines 12-17; Damani, col. 4, lines 9-12]

24. As to claims 4-5, Damani as modified teaches the invention substantially as claimed including wherein each descriptor includes an identification of the type of communication [Song, 614, Fig. 6], the sending and receiving processors [Song, 616, Fig. 6], and the virtual addresses of the buffers [Song, 608, Fig. 6].

25. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

U.S. Patent No. 5,787,775 to Ueno, and U.S. Patent No. 5,590,284 to Crosetto teach parallel processing.

26. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Qing-Yuan Wu whose telephone number is (571) 272-3776. The examiner can normally be reached on 8:30am-5:00pm.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Meng-Ai An can be reached on (571) 272-3756. The fax phone number for the organization where this application or proceeding is assigned is (571) 272-3776.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Qing-Yuan Wu

Examiner

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MENG-AL T. AN
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2100